

**Remarks**

The Examiner has rejected claims 1-3 and 5-20 as unpatentable over U.S. Patent Publication No. 2001/0051437 to Cruse in view of Koizumi, et al. U.S. Patent No. 6,863,018. In the previous action, The Examiner deemed claims 4, 15-16 allowable, whereupon applicant rewrote claim 1 to include the limitations of claim 4 to expedite prosecution.

In this response, applicant is focusing on the specific way in which the claimed invention controls the system, which is in response to detecting the presence of plasma by detecting the presence of intermodulation products that are produced by first and second RF signals in a plasma. The RF signals can be test signals specifically coupled into the plasma space within the process chamber or can be RF signals emanating from other RF energy otherwise being coupled into the process chamber, such as RF bias energy, RF plasma exciting energy, RF sputtering energy, etc. The two RF signals only need to be different RF signals, such as different frequency signals, or signals that otherwise differ, such as by phase, etc., so as to produce a detectable intermodulation product. The present invention is based in part on the principle that certain RF signals produce detectable intermodulation products when in the presence of a plasma, which intermodulation products will not be detectable intermodulation products in the absence of a plasma. At least that there will be a detectable difference between the intermodulation products produced in the presence or absence of a plasma.

The primary reference Cruse (1) does not specifically disclose the testing for the existence of a plasma, (2) does not specifically disclose the detection of an intermodulation product of two RF signals in the presence of a plasma, or (3) does not teach that detection for the presence of an intermodulation product, produced by a plasma, of two RF signals will enable the determination of the presence or absence of a plasma to provide for the control of the system in response to the determination.

Cruse discloses a generalized control system based on the principles that any or all of the measurable parameters of a processing system can be monitored for information that will enable decisions to be made in the control of the process.

Cruse discloses an optical detector for monitoring a plasma in a chamber plus some other detector for monitoring what are called "environmental parameters" of the chamber. There is no discussion of looking for RF intermodulation products from the plasma. RF parameters are monitored directly from the power supply, but no plasma-produced intermodulation of any RF power signals can be detected by this monitoring path. The monitoring of other "system parameters" is only generally discussed.

If one has possession of the Cruse process monitoring system and wanted to know whether a plasma was present or not in order to control the system, one would not know to look for intermodulation products that would be produced by a plasma from two RF signals without the invention of applicants. Therefore, Cruse does not render obvious the claims of the present application.

As for the secondary reference, Koizumi et al., which is applied to the subject matter of new claim 25 (namely, the limitations that originated in claim 4 and were added to claim 1) only the combining of signals prior to coupling into a chamber is shown. There is no teaching by Koizumi et al. of coupling first RF and second RF signals into a process chamber to produce one or more intermodulation products in the presence of a plasma, and to use the detection of the intermodulation product or products to determine whether or not a plasma is present so as to control the system in response.

Note that, in addition, amendments have been made to the claims to correct previously unnoticed antecedent and other formal matters.

For the reasons stated above, it is submitted that the claims, as amended, are patentable. Accordingly, an early allowance is respectfully requested.

Application No. 10/674,920  
Amendment dated July 10, 2006  
Reply to Office Action of March 8, 2006

Applicant does not believe that any fees are due in connection with this submission. However, if such extension is due or any other fees are necessary, the Commissioner may consider this to be a request for such and charge any necessary fees to deposit account 23-3000.

Respectfully submitted,

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